

CLAIMS

1. A single-carrier propagated signal comprising:

a preamble segment having a periodic plurality of preamble sequences, each preamble sequence containing 16 b symbols generated in accordance with:

$$5 \quad \frac{1}{32} \sum_{k=0}^{15} b_k b_{\text{mod}(k+n, 16)}^* = \begin{cases} 1, & n = 0 \\ 0, & n \neq 0 \end{cases};$$

the 16 b symbols belonging to a 4-quadrature amplitude modulation constellation, a quadrature phase shift keying modulation constellation, or a carrierless amplitude modulation/phase modulation constellation; and

a data segment appended to the preamble,

10 the single-carrier propagated signal being transmittable from a transmitter to a receiver over a communications channel.

2. The propagated signal of Claim 1, wherein the preamble segment has a three preamble sequence of periodic plurality of preamble sequences.

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3. The propagated signal of Claim 1, wherein the preamble segment has a four preamble sequence of periodic plurality of preamble sequences.

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4. The propagated signal of Claim 1, wherein the communications channel is a

telephone line.

5. The propagated signal of Claim 1, wherein the communications channel is an alternating current power line.